

REMARKS

Claims 1-3, 7 10 and 11 have been amended to clarify the claimed invention. Support can be found on page 7, lines 15-24, page 8, lines 8-17, and page 11, line 26 through page 12, line 5, for example. Claims 4-6 and 8-9 have been canceled without prejudice. Claims 12-17 have been added.

No new matter has been added in the amendments. Applicant respectfully requests entry of the amendments and reconsideration of the application in view of the amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-11 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Masaaki (JP06-074957) and in view of Tanikawa (US5,651,574).

Claim 1 has been amended and now recites:

1. An apparatus for trapping a micro-crystal, comprising:
 - a base;
 - a gripping mechanism for gripping a micro-crystal in a droplet placed in a predetermined location on said base, said gripping mechanism comprising a movable gripping member for gripping the crystal in the droplet;
 - a trapping mechanism for trapping the micro-crystal gripped by said gripping mechanism, said trapping mechanism comprising a movable trapping loop for trapping the crystal gripped by the gripping member in the droplet, said loop being insertable in the droplet and configured to retain liquid of the droplet therein by closing the loop with the liquid using its surface tension when separated from the droplet; and
 - a controller for controlling and coordinating movement of the gripping member and movement of the loop to grip the crystal with the gripping member inside the loop in the droplet and to separate the crystal from the droplet together with the gripping member and the loop, thereby retaining the crystal inside the loop with liquid of the droplet.

Due to the combination of the gripping member and the trapping loop both being insertable in a droplet, an unskilled person can securely capture a crystal from a droplet without damaging the crystal.

Masaaki discloses a trapping mechanism which is very different from the claimed invention. Masaaki discloses a pipette as a trapping means whereas the claimed invention recites a loop as a trapping means. In the claimed invention, a micro-crystal sample subjected for an analysis is separated from other crystals in the droplet using the loop and then retained therein with surface tension of the droplet. Masaaki fails to disclose this particular trapping mechanism recited in Claim 1. Tanikawa

discloses two fingers. Thus, even if Masaaki and Tanikawa are combined as suggested, it would not lead to the claimed invention.

Further, no evidence showing that the results of combining the grasping member and the trapping loop would have been predictable is provided. No apparatus which is similar to the claimed apparatus or which works in the same way is taught in the prior art. The particular configuration recited in Claim 1 solves the problems described in the instant specification as follows:

Since positions of crystals in the droplet are not stable, crystals may escape from the loop. Crystals may not move if the viscosity of the droplet is high, and if the viscosity is low they slip easily and make it difficult to load a crystal into the loop. In addition, the crystal often comes off of the loop as the loop containing the crystal is moved out of the droplet, which keeps the success ratio of looping fairly low. As a result, this looping process must be repeated many times until a crystal is successfully looped.

Furthermore, even after a crystal has been loaded into the loop the crystal sometimes comes off of the loop when the solution remaining around the crystal is replaced with one that becomes amorphous when frozen. Therefore, the chances of a crystal remaining loaded in the loop until the X-ray crystal diffraction test is conducted are very low. The resulting needs to repeat looping reduce the overall looping efficiency.
(page 2, lines 15-25)

The above problems are not even recognized in the prior art. At least for the reasons above, Claim 1 cannot be obvious over the references.

Claims 2, 3 and 7 depend from Claim 1, and at least for this reason, the grounds for rejection of these claims are moot.

Claim 10 has been amended and now recites:

10 (currently amended): A method for trapping a micro-crystal, comprising:
placing a droplet containing micro-crystals in a predetermined location;
gripping one of the micro-crystals in the droplet by a gripping member;
placing a loop into the droplet and positioning the loop to enclose the micro-crystal being gripped inside the loop, said loop being configured to retain liquid of the droplet therein by closing the loop with the liquid using its surface tension when separated from the droplet; and
separating the micro-crystal being placed inside the loop from the droplet while maintaining the position of the micro-crystal being gripped by the gripping member and enclosed by the loop, thereby retaining the crystal inside the loop with liquid of the droplet with surface tension of the liquid.

Similar to the above arguments for Claim 1, none of the references discloses (i) placing a loop into the droplet and positioning the loop to enclose the micro-crystal being gripped inside the

Appl. No. : 10/763,897
Filed : January 23, 2004

loop, said loop being configured to retain liquid of the droplet therein by closing the loop with the liquid using its surface tension when separated from the droplet; and (ii) separating the micro-crystal being placed inside the loop from the droplet while maintaining the position of the micro-crystal being gripped by the gripping member and enclosed by the loop, thereby retaining the crystal inside the loop with liquid of the droplet with surface tension of the liquid.

The same significant benefit as described above in the arguments for Claim 1 can be obtained from the method recited in Claim 10. Thus, at least for reasons similar to those discussed for claim 1, claim 10 cannot be obvious over Masaaki and Tanikawa.

Claim 11 depends from Claim 10, and at least for this reason, the grounds for rejection of claim 11 are moot.

Claims 4-6 and 8-9 have been canceled without prejudice. Applicant respectfully requests withdrawal of the rejections.

New Claims

Claims 12-17 have been added.

The apparatus recited in Claim 12 comprises both the gripping mechanism and the trapping mechanism. Claim 12 further recites that the trapping mechanism comprises a loop as a trapping means. A loop for trapping a micro-crystal is not disclosed in any of the references. Further, the particular configuration recited in Claim 12 solves the problems described in the instant specification on page 2, lines 15-25. This significant benefit because of the recited configuration cannot be expected in view of Masaaki and Tanikawa.

At least for the reason above, Claim 12 cannot be anticipated by or obvious over the references, and thus patentable. Claims 13-15 depend from Claim 12, and at least for this reason, these claims also are patentable.

Claim 16 recites (i) placing a loop into..., and (ii) separating the micro-crystal..., which are not disclosed in the references. Since all of the limitations recited in Claim 16 are not disclosed in the references, and further, significant effects of Claim 16 described in the specification (page 2, lines 13-25) cannot be expected from the references, Claim 16 is patentable over Masaaki and

Appl. No. : 10/763,897
Filed : January 23, 2004

Tanikawa and thus patentable. Claim 17 depends from Claim 16, and at least for this reason, claim 17 also is patentable.


CONCLUSION

In light of the Applicant's amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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